

Page 960 HZps

JOHN H. LEAVELL
NATURAL RESOURCES
SUITE 308 BEACON BUILDING
TULSA, OKLAHOMA

December 12th, 1945.

*This letter
was
ack. on
Dec. 28.*

Senator Ferguson,
Senate Office Bldg.,
Washington, D. C.

Dear Senator:

As per a telephone conversation with Mr. George Meader today, I enclose herewith a copy of a voluntary report submitted by me personally in April 1941 to Mr. Patterson, Assistant Secretary of War, and through him to General Watson and others of his staff. It was also submitted to Secretary Knox of the Navy Department, and it was also forwarded to the Navy by an Admiral stationed on the west coast (I think it was Admiral Horne) and marked 'top secret'. It was submitted to Mr. Hornbeck of the State Department; to Mr. Harry Hopkins of Lend Lease; and to the British, Dutch and Australian Embassies.

The staff members of the War Department with whom I consulted said they thought it was of great importance but felt that action could only be taken by the White House and they did not feel in a position to push the matter.

Secretary Knox said that he had heard of the matter but evinced no interest or desire for information on it.

Mr. Hornbeck of the State Department said that he expected no trouble with Japan, and further that we could not suggest such action to the British and Dutch as that was their territory, in spite of the fact that we were advancing lend lease by the hundreds of millions of dollars at that time. He evinced no interest in the matter.

Harry Hopkins was very gracious, giving me considerable time, but made no promise of going further into the matter and I heard nothing from him.

I had three interviews with the British Embassy and was finally informed that they had shown sufficient interest in the matter that the Ambassador telephoned London the gist of the subject but had received no encouragement from London.

The Dutch Embassy was co-operative in giving me full information as to such inadequate plans for destruction as they had made, which appeared satisfactory to them. They were entirely non-committal.

Mr. Casey, the Australian Ambassador, was enthusiastic about the plan, as he recognized the danger to his country and gave me every possible aid in my contacts with the British.

I also enclose a separate copy of a letter sent to Secretary Patterson, to the attention of Mr. Bundy, who had asked for further substantiation of my estimates that it would require three years for the Japanese to develop 50,000 barrels per day of refined products in the Dutch East Indies if all wells and their tubular

2.
Senator Ferguson.
12-12-45.

DEPARTMENT OF COMMERCE
BUREAU OF FOREIGN AND DOMESTIC COMMERCE

goods were destroyed and if the pipelines and refineries were destroyed. I also forwarded him at that same time a letter from Mr. Carroll L. Wilson, Director of the Department of Commerce, which disclosed that in 1940, and at an increasing rate in 1941, we were continuing to export to Japan heavy portable drilling equipment, much of which equipment came from my home town, and which Japan could only need in the event the wells were destroyed in the East Indies and it was necessary for her to drill new ones, about which Mr. Hornbeck of the State Department was quite complacent.

While the exports of drilling equipment were not necessary for Japan, as the Dutch and British did not destroy their oil field, refineries and pipe lines to as much as 50% and the Japs in short order had petroleum to their ultimate requirements available to them in a matter of weeks, yet these exports were bad in that it gave the Japanese some degree of confidence of their ability to rehabilitate the fields.

The knowledge by the Japanese of the negation of the use of Dutch East Indies oil, even though she overran the Dutch East Indies, which it was obvious she could do, was the only sure way that we could have obviated war with Japan.

It must be remembered that this report was made by me prior to Hitler's insane attack upon Russia and it was assumed by me that such an attack would not be made until he had broken the back of the British Empire by the capture of the Persian Gulf area, which he could have done at that time unless Great Britain had our full assistance.

I hope that this letter gives you the information you desire and that it at least will bring out the major importance of the control of oil in world strategy.

Most sincerely yours,

John H. Leavell
JOHN H. LEAVELL.

JHL;t

Specifically regarding oil country pipe, it is understood that Japan has not in the past produced such pipe except, perhaps, in the smallest diameters which are not much in use today in oil fields.

If we can be of further service to you in this connection we shall be glad to aid you in any way we can.

Sincerely yours,
(Signed) Carroll L. Wilson
Carroll L. Wilson
Director

C
O
P
Y

DEPARTMENT OF COMMERCE
BUREAU OF FOREIGN AND DOMESTIC COMMERCE
WASHINGTON

April 28, 1941

Colonel J. H. Leavell,
Room 1043, Mayflower Hotel,
Washington, D. C.

Dear Sir:

With reference to your telephone request for information relating to United States exports of oil field drilling equipment, refining equipment, and casing and oil line pipe to Japan, I give you below statistics of these classes of commodities:

<u>UNITED STATES EXPORTS TO JAPAN</u>		
<u>Year</u>	<u>Petroleum and Gas Well Drilling Apparatus and Parts</u>	<u>Other Petroleum Well and Refining Machinery Parts</u>
1939	\$ 86,027	\$ 378,062
1940	348,894	96,435
Jan.-Feb. 1941	212,994	9,223
	<u>Seamless Casing and Oil Line Pipe</u>	<u>Welded Casing and Oil Line Pipe</u>
1939	73 Gross Tons	None
1940	287 Gross Tons	23 Gross Tons
Jan.-Feb. 1941	None	None

Concerning production of these items in Japan, we do not find in our records any detailed data, but it is believed from the knowledge of members of the staff of this Bureau that the production is negligible in quantity.

Specifically regarding oil country pipe, it is understood that Japan has not in the past produced such pipe except, perhaps, in the smallest diameters which are not much in use today in oil fields.

If we can be of further service to you in this connection we shall be glad to aid you in any way we can.

Sincerely yours,
(Signed) Carroll L. Wilson
Carroll L. Wilson
Director.

C
O
P
Y

- 2 -

period. In Continental United States we drilled 30,000 Wells. The comparison would be that Japan has a personnel of 1/10th of 1% of our country.

I would estimate that it would take a year for these fields to be drilled up were they in the United States. To get at it a different way, 30 wells at two months per well, would mean that Japan had five rigs running steadily last year. This number would have to be increased 2000% to make any impression on the Dutch East Indies. April 29, 1941.

Honorable Robert Patterson, I assume, I refer you to paragraph four Under Secretary of War, Commerce letter of April 28, 1941. Washington, D. C.

"Specifically regarding oil country pipe, it is understood that that Japan has not Attention: Mr. Bundy. ch pipe except, perhaps, in the smaller diameters which are not much in use today in oil Gentlemen:ds."

Supplementing my report of December 21 relative to the destruction of oil wells in the East Indies, I submit the following as a very rough estimation of the amount of oil in barrels per day which the Japanese could be reasonably expected to develop in event of the conquest of these Islands: concerning production of these items in Japan, we do not find

in our records any detailed data, but is believed from the known First year - 5,000 to 15,000 Barrels
Second " - 15,000 to 40,000 "
Third " - Over 50,000 Barrels

Having made an assumption that there are five rigs available in Japan for drill I make these estimates based upon relatively undisturbed conditions of warfare in the fields where the Japanese would be drilling, and I base this upon the following assumptions of fact: of 1941. The Department of Commerce has no record of the number of drilling outfits that this consists of. First: Japan is exceedingly short of oil field personnel (trained). maximum of 200,000. If we take an average of 365,000, which would be small equipment, it will mean an export during this period of ten outfits. Second: She has no pipe industry to furnish the casing, tubing and oil field lines, and I assume that it would take four months for Japan to overrun the East Indies, pacify them, organize and import into. Third: She is exceedingly short in drilling equipment for the oil fields. complete one well every sixty days and that only one well in six would be a failure. This would mean that there would be four complete. Relative to the personnel, the only data available is that in 1940 Japan drilled 14 commercial producers. If we assume that she drilled an equal number of dry holes it would make approximately 30 wells for the entire Empire during that same three times the percent average of the fields, would be 165 barrels per well and the total daily production at the end of the year would be 8,000 barrels per day.

period. In Continental United States we drilled 30,000 Wells. The comparison would be that Japan has a personnel of 1/10th of 1% of our country.

I would estimate that it would take a year for these fields to be drilled up were they in the United States. To get at it a different way, 30 wells at two months per well, would mean that Japan had five rigs running steadily last year. This number would have to be increased 2000% to make any impression on the Dutch East Indies.

Relative to the second assumption, I refer you to paragraph four of the Department of Commerce letter of April 28, 1941.

"Specifically regarding oil country pipe, it is understood that that Japan has not in the past produced such pipe except, perhaps, in the smaller diameters which are not much in use today in oil fields."

Relative to the third assumption, I refer to paragraph three of the same letter in referring to the manufacture of drilling equipment, Mr. Wilson states:

"Concerning production of these items in Japan, we do not find in our records any detailed data, but is believed from the knowledge of members of the staff of this Bureau that the production is negligible in quantity."

Having made an assumption that there are five rigs available in Japan for drilling in the East Indies prior to 1939 and adding the total exports of this type of equipment, gives a total of approximately \$650,000 for the years 1939-40 and the first two months of 1941. The Department of Commerce has no record of the number of drilling outfits that this constitutes, but drill rigs complete cost a minimum of \$40,000 and a maximum of \$200,000. If we take an average of \$65,000, which would be small equipment, it will mean an export during this period of ten outfits. This added to the five which might be available prior to this would give them fifteen rigs. I assume that it would take four months for Japan to overrun the East Indies, pacify them, organize and import into them equipment and pipe for drilling, and that thereafter each rig could complete one well every sixty days and that only one well in six would be a failure. This would mean that there would be four completions per unit for the first year, or sixty wells, less ten dry holes would be fifty producers. The average well in the Dutch East Indies produces 55 barrels per day. If we assume that they use exceedingly good judgement and selected locations three times the percent average of the fields, would be 165 barrels per well and the total daily production at the end of the year would be 8,000 barrels per day.

I think in making this estimate I have given the Japanese the advantage of all of the breaks. You will notice also approximately 350 gross tons of oil field pipe were shipped in the last two years. This is about enough pipe for seven wells and was no doubt consumed last year in Japan.

It is interesting to note that of the \$560,000 worth of drilling equipment which were shipped to Japan, all but \$16,000 of this was exported after my report was sent to the Department.

I am sorry that more exact figures are not available on such short notice, but a more accurate report and estimate can be made if sufficient time is allowed. I think however, it will be purely historical and not practical as we can get the figures from the Japanese if there is much delay.

Yours very truly,

P. S. I have made no reference in this to refinery equipment. This is a highly specialized business, almost entirely manufactured in the United States and Germany of alloy steels and Japan neither has in the past nor could in the future manufacture this equipment. The refineries and the pipe lines in the East Indies are more vulnerable to destruction than the wells themselves, but I have assumed that in a pinch Japan could use crude oil in place of fuel oil and that her refineries could manufacture a supply sufficient for her absolute necessities in her own refineries located in Japan, and that the pipe lines could be temporarily dispensed with by using trucks, barges and small tankers.

The plan proposed herein has for its object the removal of Japan as a present or potential military or naval belligerent by the immediate destruction of a portion of the wells of the East Indies and the preparation for the destruction of them all.

This action would destroy 45% of Japan's present source of supply of petroleum and safeguard 160% of her potential supply and substitute other sources of supply wholly subject to our control.

It further discusses oil and its relation to the war in its present status.

It is predicated upon these hypothesis:

- (1) What cannot be defended must be destroyed.
- (2) No man ever destroys his own property.
- (3) Whichever of the two, Germany or England, first secured a substantial superiority in all of the following: (a) bomber planes (b) aviators (c) aviation bases and fields (d) unlimited amounts of aviation gasoline (e) unlimited explosives and/or crude oil, will destroy the other.

This will be accomplished by the simple expedient of drenching the opposing cities and airfields with crude oil up to 200,000 barrels per day and igniting this with explosives and incendiary bombs as far as available.

Germany presently has the superiority in all of the above with the exception of aviation gasoline and crude oil.

(4) If Germany is permitted to gain control and hold the Mesopotamian basin and the head of the Persian Gulf, she will automatically drive England out of Egypt and the Mediterranean Sea and all of Northern Africa.

(5) Even though the British should have the equipment, personnel and opportunity to destroy these wells and refineries before surrendering them, and it is highly improbable that they would or could destroy them, Germany could within 15 months redrill the oil wells, repair and extend the pipe lines of that area and supply herself with sufficient fuel, as outlined above, to utterly destroy the cities of the British Isles in a very brief time.

(6) England can only hope to retain or regain control of the head of the Persian Gulf with the aid of the U. S. Navy, transports, U. S. Equipment and a U. S. Expeditionary Force to this area.

(7) If the convoy lines from our West Coast and the Panama Canal to the head of the Persian Gulf are made safe, a battle front on the lower Euphrates can be maintained on a basis more favorable to the British than to the Axis powers.

It is probable that this is the only battle front now in prospect where conditions would be more favorable to the Allies than to the Axis.

(8) As long as the head of the Persian Gulf is in the hands of the Allies, it is highly improbable that England will fall, for without this oil Germany cannot secure control of the air over England.

(9) In the event that England did fall and surrender her fleet, an invasion of the Western Hemisphere is wholly impractical until the Axis has full use of the oil from the fields at the head of the Persian Gulf.

(10) To maintain a major front in the Euphrates Valley necessitates the elimination of the Japanese fleet as a threat to our lines of communication between our West Coast and the Persian Gulf.

(11) The Japanese fleet can be eliminated either by destruction in battle, or denying to Japan the necessary oil for economic, military and naval existence.

(12) That Japan would accept this latter alternative without attempting to forcibly take possession of the 180,000 barrels daily of almost unprotected oil in the Dutch and British East Indies is quite improbable, when she knows that the fields are now inadequately protected against seizure and that wholly inadequate provision has been made for their destruction by their owners.

(13) If, however, were all of the oil wells on the Island of Borneo, all of which could be readily seized by the Japanese, destroyed now, a "fait accompli", and were complete arrangements made with skilled American civilian personnel, under the direction of our Army or Navy, with all necessary equipment and material made ready in the oil fields to quickly and utterly destroy the balance of the oil wells in Sumatra and Java after Japan might attack, but, before the Japanese could possibly arrive in the fields themselves, and were this fact known to the Japanese, and were a substantial proportion of our Pacific Fleet based on Singapore, under these circumstances, it is highly improbable that Japan would attempt to secure possession of the East Indies.

(14) Japan would know further that though victorious over the combined fleets of her opponents, that she could not develop her requirements of oil under three years or in time to prevent an utter disaster to her internal economy and to her naval and military forces now committed in China.

(15) The oil wells and their equipment and pipe can be destroyed without destroying the natural resource of the oil in the ground. The equipment and personnel to accomplish this in time can be secured only in the United States, within a few days time and with great secrecy, and can be transported to the East Indies in thirty days from embarkation.

The bulk of their raw and finished products were left available for the immediate use of the conquerors.

(2) Capital is international EXPLANATORY NOTES and usually believes it can continue

to exist whoever wins the struggle.

(1) Knowing in advance that Germany would necessarily carry on an offensive war,

Capital cannot be trusted to destroy itself. No adequate provision was made in any of the countries likely to be invaded, to destroy those things which would be of help to Germany if her attack were successful. This job of destruction was everybody's business and therefore nobody's business, and not attended to. It is simply contrary to human nature for individuals or companies to destroy their wells and plants, and defeated nations are too busy, too late, or too stupid to see that they are destroyed.

In oil alone, which is more important than food, munitions and equipment, in conquered countries, Germany's enemies have permitted her to increase her daily supply of oil to 300% of what she had in September 1939.

(3) Germany estimated that in her latest month of bombing of England that 8,000 tons of bombs were dropped, or about 200 tons per day. That this figure was

She still does not have enough oil to support her economy and carry on an all out war, over a protracted period of time. not a multiple can only be answered by lack of fuel and explosives.

If we are to take our own production of future planes and Germany's statements There are some who argue that Germany has all the oil she needs because she has been of present production of planes and weapons at exploding like their face value, too able to successfully conduct five campaigns successfully. This argument is faulty. Her thousand bombers, plus reserves, will surely be available for an attack by either side. enemies simply furnished her all the oil she needed where she needed it, but furnished Germany has unlimited locations for additional air fields. England is already her no opposition for lack of competitive equipment worthy of the name for any length of time for any distance. hampered for airfield locations and her bomber program just started.

These bombers will have an average carrying capacity of at least three tons of Further, consumption figures issued by Germany are pure propaganda issued to fool the very people it is fooling. bombs or 30,000 tons per trip, or 300,000 barrels. Explosive bombs on such a basis cannot be supplied. They are very expensive to make, dangerous to load, transport and handle.

If Germany has oil why does she wait so long between her all out raids on London? In peace times the economy over which Germany rules for 300,000,000 people consumed

over 400,000 barrels per day. Now the total available, including Roumania and synthetic, is not over 200,000 barrels, at the very top estimate probably 150,000 barrels. This must supply, in addition to the imperative demands of industry, the Axis armies of 9,000,000, their air forces, their sea forces and submarines. crude oil in drums is substituted for barrels and it can be readily delivered to

The estimate for our army of 1,250,000 is at the rate of 75,000 barrels daily.

It is a fact, however, that in modern war no invaded country has been able, or even willing, to destroy its means of producing natural resources, or even the plants which convert them to economic use. Even the finished products, such as refined oil, are left for the use of the conquerors, even Yugoslavia and Greece.

Relative to oil production; the oil fields of Czechoslovakia, Poland and Roumania were left intact for the conquerors, although ample time was available to the defenders to destroy them. The failure by either the British or their owners to destroy the oil wells and refineries in Roumania will turn out to be the blackest scandal of the war.

In Norway, Holland, Belgium and France, the refiners were left intact and the great bulk of their raw and finished products were left available for the immediate use of the conquerors.

hundred wells would have to be drilled by Germany to meet all of her possible requirements.

(2) Capital is international in its outlook and usually believes it can continue to exist whoever wins the struggle.

Capital cannot be trusted to destroy itself.

It is simply contrary to human nature for individuals or companies to destroy their wells and plants, and defeated armies are too busy, too late, or too stupid to see that they are destroyed.

No man ever destroys his own property.

(3) Germany estimated that in her heaviest month of bombing of England that 8,000 tons of bombs were dropped, or about 300 tons per day. That this figure was not a multiple can only be explained by lack of fuel and explosives.

If we are to take our own estimates of future planes and Germany's statements of present production of planes and aviators at anything like their face value, ten thousand bombers, plus reserves, will shortly be available for an attack by either side.

Germany has unlimited locations for additional air fields. England is already hampered for airfield locations and her bomber program just started.

These bombers will have an average carrying capacity of at least three tons of bombs or 30,000 tons per trip, or 200,000 barrels. Explosive bombs on such a basis simply cannot be supplied. They are very expensive to make, dangerous to load, transport and handle.

If crude oil in drums is substituted for explosives it can be readily delivered to the air fields by pipe line for loading into drums.

If Germany holds the Persian Gulf and has constructed additional pipe lines to the Mediterranean, quantities in excess of this will be available to her.

The use of such vast quantities of oil with incendiaries obviates any necessity for accuracy and would be utterly beyond the capacity of fire fighting equipment to control. Unarmed transports will be used when once the enemy's airports are well drenched.

This sounds fantastic but so is whole war.

(4) Oil from Iraq and the Mesopotmian basin is the sole source of oil, except for storage and 20,000 barrels daily in Egypt, for the British Navy in the Mediterranean and for British armies in Egypt and East Africa. Retirement of the British Navy and abandonment of her fortified islands will be automatic.

(5) Unlike the East Indies where oil has been produced for fifty years and the average well is small (50 barrels per day) the fields of the Mesopotmian basin are new.

They have been properly developed and the gas pressure on the wells maintained. Wells drilled in this area would average more than 1,000 barrels per day so that only a few hundred wells would have to be drilled by Germany to meet all of her possible requirements.

Germany can manufacture all of the drilling equipment she would need above that she would take out of Roumania. She can impress the needed trained personnel from Roumania.

Germany already has a vast oil field pipe industry.

Italy and France have sufficient tankers in the Mediterranean to transport the oil to Marseilles and the Adriatic ports.

By repairing the pipe lines to Haifa and Tripoli and adding two 16" lines from the Persian Gulf, in excess of 300,000 barrels daily could be transported to the Mediterranean without control of the Indian Ocean. This would be quite an engineering feat even for Germany's ability to organize. American engineers could do the job in nine months. The Germans could do it in a year.

(6) England had practically no tank or heavy equipment at the start of the war. What has been manufactured since then has been delivered to the Germans in France, Norway, Greece and Lybia.

What equipment is not absolutely essential for the defense of the British Isles is concentrated in Egypt. This equipment is not available for the Mesopotamian area, for to leave Egypt would lose the Mediterranean, even if wise, England will not do this. When her present storage of oil for Egypt is depleted this equipment can only move up the Nile, if not captured.

It is possible that Britain might furnish the soldiers, but certainly the transports, equipment, planes and supplies must come from our west coast.

(7) A glance at the map will show that the oil fields and refineries on the Persian Gulf are very close to the shore and can be almost wholly protected by the navy.

The oil fields of Iran are at the edge of the mountains, about 100 miles northeast of the head of the Persian Gulf. They can be defended under better than average conditions for oil fields.

The Tigris and the Euphrates flow in a southeasterly direction through a broad valley whose northeastern edge is high mountains and whose southwestern edge is a vast, real desert one thousand miles in width.

An army defending this area would have a short, narrow gauge railroad and two rivers for transportation at its back. Any army attacking it would have one long poorly equipped single track railroad and 1,000 miles of desert at its back before it reached the Mediterranean, where it would be 1500 miles from its base.

(9) To contemplate an inter-continental invasion presupposes several million tons of merchant marine, mostly oil burners and diesels, and a stupendous naval fleet, all oil burners.

Without this source of oil there is simply not enough oil to start.

The same reasoning applies to Japan, the East Indies and the Pacific.

(10) A glance at the accompanying map shows the Persian Gulf about one-half way around the world from San Francisco. Japan's mandated islands lie squarely across this route. The route from our East Coast, or from England around South Africa, is already beset with submarines and bombers based on West Africa.

With Japan eliminated from consideration, German raiders cannot successfully operate in the Indian and Pacific Oceans. They would lose their fueling bases and their eyes and ears. ~~lost a year under war conditions.~~

(11, 12, 13) Japan is an island empire, more dependent upon its sea borne commerce for its economic life and naval power than any other country in the world with the possible exception of England, Holland and Belgium. Almost 50% of her merchant marine use oil as fuel. Being one of the three Axis powers, and with a fleet approaching the size of our own, Japan is able to keep the great bulk of our fleet practically immobilized in the Pacific, and prevent the use of our mighty fleet as convoys and in determining the issue of the war in European waters, where the issue must be finally determined if we win the war.

In order to free our fleet for Atlantic and the near East, the danger from Japan's naval power must be eliminated. This can be done in only two ways - one is an attack upon Japan in the Orient, the outcome of which is doubtful owing to the great distances from our bases, and at the best would divert such an immense amount of our help from England that she would be almost certain to be defeated while we were engaged in the Orient. Such an outcome would be a defeat for us even though we were successful in the Orient.

The second, and cheaper, quicker and surer means of accomplishing this end would be the immediate destruction of the oil wells in the East Indies which are subject to immediate seizure by Japan and the complete arrangement for the immediate and utter destruction of all of the other wells if their seizure is seriously threatened by Japan.

Japan's total normal consumption of all types of oils is 110,000 barrels per day. 50,000 barrels of this comes, chiefly, from California, with small amounts from Mexico and Venezuela through the Panama Canal. 47,000 barrels comes from the British and Netherland East Indies, and about 3,000 barrels from the Persian Gulf.

Japan produces in Japan and neighboring islands and from synthetic sources only about 10,000 barrels or less than 10% of her requirements.

Japan's navy consumes about 20,000 barrels daily in peace time. This is an

estimate based upon a peacetime consumption of 30,000 barrels daily for our own navy. Indies.

These are approximate figures but they show that ten out of eleven barrels of oil used in Japan comes from across the sea, the nearest being the East Indies, which is 2,000 miles away. the plan.

Some years ago, Japan attempted to accumulate a six months store of oil in Japan, but the best information available is that this storage does not exceed three months supply in commercial storage. Our navy estimates that Japan has enough oil in secret storage to last a year under war conditions.

This would seem a very high estimate if the official estimates of consumption of oil in 1941 by our navy under war conditions are to be credited. Our navy estimates its needs under war conditions in 1941 at 300,000 barrels daily. The Japanese navy is two-thirds the size of our navy, so on this basis it would consume 200,000 barrels daily under war conditions, or 72,000,000 barrels per annum for the navy alone. We know their army, their industry and commerce consume 30,000,000 barrels annually, and civilians almost none. The sum of these two is over 100,000,000 barrels, or 1900 - 55,000 tanks. That many tanks are hard to hide in a place the size of Japan. I grant that estimates based upon such statements are quite misleading. I have heard no estimate of supplies of oil for all purposes in Japan at over 55,000,000 barrels.

It is therefore apparant that if Japan were cut off from ten out of every eleven barrels of oil of her minimum economic and naval requirements, for even a brief period, her internal economy would be utterly disrupted and her fleet immobilized and her China army stranded.

By cutting off all sources of oil to Japan and basing a portion of our Pacific fleet in the far East, Japan would be forced to fight when and where we want her to fight, sit still and slowly perish, or make the best terms that she could for some oil and our friendship.

Presently, it would be hopeless for England and Holland to defend the East Indies against a determined attack by Japan, and as these islands produce 182,000 barrels daily of good oil, and have a refining capacity of 180,000 barrels, their conquest by Japan would leave her permanently predominant in Eastern Asia and the South Pacific, would necessitate our surrender of the Philippines and Guam, and the abandonment of free China, and would at the same time cut us off from necessary rubber and tin, disrupting our economy many billions of dollars per annum.

This would still be true even though a full one-half of the oil wells were destroyed after conquest started. It is highly improbable that as much as 10% could

I make these estimates based upon relatively

be destroyed with the personnel and material now on hand and available in the East Indies.

As an illustration of the utterly pathetic plans that the Dutch Colonials have made to destroy their wells, I give herewith the plan as described to me by the Dutch officer that made the plan.

Tarakan Island is a small island just off the East Coast of Borneo. The oil field lies on a peninsula, as its south end, being three miles from the shore. Relative to the personnel, the only data available is that in 1940 Japan drilled in one direction and two miles in the other.

The plan is to fight the Japanese navy for the field with several pieces of artillery and at least two companies of native riflemen. While the fight is going on the civilian oil well employees will destroy the source of power for pumping the wells and destroy the water line to the oil fields so the Japanese would have no water with which to drill more wells, and would drop old pipe down the wells, giving

the Japanese difficult "fishing" jobs. There are 300 wells in this field. This confirms the type of preparation existing generally as told to me by returning engineers. As one of them said, "The Dutch are going to hide the Stillson wrenches so the Japs can't open the valves."

The oil that would be shut off in Borneo is just about the amount that Japan presently gets from the East Indies. If friendship is re-established with Japan, this oil could be readily supplied from California and through the Panama Canal, when, as and if our national interest sanctioned it.

(14) I submit herewith an almost exact copy of a letter I submitted to the War Department on April 29th of this year.

Honorable Robert Patterson,
Under Secretary of War,
Washington, D. C.

Gentlemen: "Concerning p Attention: Mr. Bundy.

Supplementing my report of December 21 relative to the destruction of oil wells in the East Indies, I submit the following as a very rough estimation of the amount of oil in barrels per day which the Japanese could be reasonably expected to develop in event of the conquest of these Islands if the wells had been destroyed before capture:

two months of 1941. First year - 5,000 to 15,000 barrels.

Second year - 15,000 to 40,000 "

Third year - over 50,000 "

Instead of the 182,000 barrels per day now produced from 3,200 wells.

I make these estimates based upon relatively undisturbed conditions of warfare

I assume that it would take four months for Japan to over-run the
in the fields where the Japanese would be drilling, and I base this upon the following
assumptions of fact: thereafter each rig could complete one well every

First: Japan is exceedingly short of oil field personnel (trained).

Second: She has no pipe industry to furnish the casing, tubing and
oil field lines, and

or, or 80 wells, less 12 dry holes, or lost holes, would be 68 are
Third: She is exceedingly short in drilling equipment for the oil fields.
The average well in the Dutch East Indies produce 55 barrels per day.

Relative to the personnel, the only data available is that in 1940 Japan drilled
we assume that they use exceedingly good judgment and selected locations
14 commercial producers (See report of Dec. 26, 1940. Oil and Gas Journal). If we
three times the present average of the fields, would be 165 barrels per
assume that she drilled three times that number of dry holes and small producers, it
well and the total daily production at the end of the year would be 10,220
would make approximately 60 wells for the entire Empire during that same period.
barrels per day.

In Continental United States we drilled 30,000 wells. The comparison would be that

I think in making this estimate I have given the Japanese the advantage
Japan has a personnel of 2/10th of 1% of our country.

of all of the breaks. You will notice also approximately 350,000 tons
I would estimate that it would take a year for these fields to be drilled up
oil field pipe were shipped in the last two years. This is about
were they in the United States. To get at it a different way, 60 wells at two

months per well, would mean that Japan had ten rigs running steadily last year. This

number would have to be increased 2,000% to make any impression on the Dutch East
equipment which were shipped to Japan, all but \$16,000 this was
Indies.

Relative to the second assumption, I refer you to paragraph four of the
Department of Commerce letter of April 28, 1941:

Quote. "Specifically regarding oil country pipe, it is understood that Japan
has not in the past produced such pipe except, perhaps, in the smaller diameters which
are not much in use today in oil fields." Unquote.

Relative to the third assumption, I refer to paragraph three of the same
letter in referring to the manufacture of drilling equipment, Mr. Wilson of the
Department of Commerce states:

Quote. "Concerning production of these items in Japan, we do not find in our
records any detailed data, but it is believed from the knowledge of members of the
staff of this Bureau that production is negligible in quantity." Unquote.

Having made an assumption that there are ten rigs available in Japan for drilling
in the East Indies prior to 1939 and adding the total exports of this type of
equipment, gives a total of approximately \$650,000 for the years 1939-40 and the first
two months of 1941. The Department of Commerce has no record of the number of drilling
outfits that this constitutes, but drill rigs complete cost a minimum of \$40,000 and a
maximum of \$200,000. If we take an average of \$65,000, which would be small equipment,
it will mean an export during this period of ten outfits. This added to ten which
might be available prior to this would give them 20 rigs.

I assume that it would take four months for Japan to over-run the East Indies, pacify them, organize and import into them equipment and pipe for drilling, and that thereafter each rig could complete one well every sixty days and that only one well in six would be a failure. This would mean that there could be four completions per unit for the first year, or 80 wells, less 12 dry holes, or lost holes, would be 68 producers. The average well in the Dutch East Indies produce 55 barrels per day. If we assume that they use exceedingly good judgment and selected locations three times the present average of the fields, would be 165 barrels per well and the total daily production at the end of the year would be 10,220 barrels per day.

I think in making this estimate I have given the Japanese the advantage of all of the breaks. You will notice also approximately 350 gross tons of oil field pipe were shipped in the last two years. This is about enough pipe for seven wells and was no doubt consumed last year in Japan.

It is interesting to note that of the \$560,000 worth of drilling equipment which were shipped to Japan, all but \$16,000 of this was exported after my report was sent to the Department.

I am sorry that more exact figures are not available on such short notice, but a more accurate report and estimate can be made if sufficient time is allowed. I think however, it will be purely historical and not practical, as we can get the figures from the Japanese if there is much delay.

Yours very truly,

JOHN H. LEAVELL
Lt. Col.,-Eng. Res.
Mayflower Hotel.

(See following page for postscript to above letter)

P. S. I have made no reference in this to refinery equipment. This is a highly specialized business, almost entirely manufactured in the United States and Germany of alloy steels and Japan neither has in the past nor could in the future manufacture this equipment. The refineries and the pipe lines in the East Indies are more vulnerable to destruction than the wells themselves, but I have assumed that in a pinch Japan could use crude oil in place of fuel oil and that her refineries could manufacture a supply sufficient for her absolute necessities in her own refineries located in Japan, and that the pipe lines could be temporarily dispensed with by using trucks, barges and small tankers. (End of quoted letter).

For the benefit of those who are not familiar with the rudiments of oil, I will explain very briefly its source and production.

Oil is produced from previous sand and line stratas lying below the surface of the earth and underneath other impervious stratas which prevent further migration of the oil, and at the same time makes a closed structure.

Generally, the oil well is drilled to the top of the producing horizon and a string of pipe - called the casing - is set on top of the producing sand, and quick setting cement is pumped under pressure down the casing and up around the lower portion of the outside of the casing. This prevents the oil from coming out of the producing horizon where it is usually under considerable pressure, up to several thousand pounds, and escaping on the outside of the casing and dissipating the oil in upper stratas and also prevents the flooding of the oil horizons with salt water from the higher beds.

It is quite simple, with sufficient personnel and equipment, to destroy an oil well by lowering nitroglycerin down the inside of the oil casing and exploding it, but this procedure not only destroys the oil well itself but destroys the oil field as well, as the oil from the producing horizon will, in the course of time, be dissipated and the field ruined by encroachment of salt water and the loss of the gas in the oil.

If you do not hope to have possession of the fields after the war, this method is fairly satisfactory.

In order that the wells in the field may be destroyed without the permanent loss of the natural resource, it is necessary that before destroying the casing that quick setting cement be pumped into the bottom of the hole, filling up that portion of the well in the producing horizon below the bottom of the casing, and that the lower portion of the casing itself be filled with Cement.

In this way the producing horizon is as effectively closed as it was before any wells were drilled and there is no permanent loss of the oil remaining in the sand. If subsequent to this the casing is shot with nitroglycerin in a couple of places up the hole, the well as such is so effectively destroyed that it is several times as quick to drill a new well as to attempt to recover the old well.

After all of the wells in a field have been destroyed this way, the only effect upon the field will have been to waste the cost of drilling new wells, and injecting a very considerable loss of time in drilling new wells.

In the case of the East Indies, I would say a minimum, as far as Japan is concerned, would be three years.

The great bulk of these oil wells have been developed in the jungle and under difficult conditions of development and operation, and by the same token the element of time involved in their destruction would be considerably greater than would be necessary if in the United States.

It would be an economic crime while destroying these oil wells, to destroy the oil fields themselves. I refer to the oil in place. The oil fields themselves, if the wells are destroyed after invasion starts, would be destroyed, but if arranged for in advance can be preserved.

This can be done by making what is known as a cement "squeeze job" on the oil itself and the lower sections of the producing string of pipe. This will as effectively preserve the oil reservoir as if the wells had never been drilled, with the exception of certain lower portions of the formations which might be now making large percentages of water relative to oil. On these wells there would be some waste.

Having cemented off the oil horizons, the pipe above the cement plug can be shot with nitroglycerin in two places, so that from a practical standpoint it would be utterly impossible to ever put the present wells on production again, and it would be necessary to drill in the future, after the war is over, twin wells to the present producing wells to recover the oil still remaining in the sand.

It might be argued that Japan could do this. Theoretically, she could, but practically, she could not develop 50,000 barrels of oil per day, if unhampered, in two years, for the following reasons:

be easily plugged in less

1st. She does not possess the technical personnel to do this, and the development of oil at considerable depth calls for more technical labor and supervision than any other industry.

2nd. She has no drilling equipment.

3rd. She has no available pipe.

It is questionable, even if the fields were turned back to the present owners, with all their technical skill and material, that they could bring the fields back to present production under two years.

I am considering this as a purely military problem where cost is unimportant and time is the sole consideration.

I am assuming that from the day that the plugging of these wells start that it would be necessary to absolutely complete the job within but forty days, and I give herewith a very rough approximation of the time, material and personnel it would take to do this job in that period of time after they were in the fields with their material and equipment. There is a total of 3255 producing wells in the East Indies, with depths from 130 feet to 6300 feet. The youngest field is 31 years old, and the oldest field is 55 years old.

I have assumed that 1255 of these wells are shallower than 2000 feet in depth and could be successfully cemented and the casing shot by the present operators on the ground without a "squeeze job", and within the 40 day time period.

That would leave 2,000 wells which would call for professional oil well cementing companies personnel and equipment. I have assumed that a cementing crew of five men per shift can complete a "squeeze job" on four wells in three shifts totaling 24 hours. In order to accomplish this rapid rate of plugging it would call for four pulling units to each cementing unit, each pulling unit consisting of a four men per shift and working three shifts per 24 hours.

For safety, I assume that 20 cement outfits, in addition to what might be now in the fields, should be sent from the United States to cement the 2,000 deeper and more difficult wells at the rate of 80 per day.

These figures show that the job could be done in 25 days, but probably due to having to repeat, sickness, unforeseen accidents, etc., they could be safely plugged in less than 40 days with this equipment.

All of this equipment and personnel could be accumulated and loaded in fairness to the companies some arrangement should be made to on railroad cars in the United States within 20 days time. compensate them for their loss for pre-arranged destruction.

The personnel would consist of 300 men for the cementing equipment and 960 men on the pulling units, to which must be added 5% for sickness but contract during the lease period to pay them their average net profit and injuries and another 5% for supervision, and 30 well shooters, which would bring the total personnel to around 1420 men.

Allowing 40 sacks of cement per well, which I think is probably present condition when the war is over, in the event we won the war, and let them bear the loss if we lose the war,

ample, would call for 130,000 sacks of 6500 tons of quick setting cement, An expedition of specialist of this kind, with their equipment, and estimating 15 quarts of nitroglycerin each for 3200 wells will call would be available for the Mesopotamian area if needed, but the problem for 48,000 quarts, or approximately 75 tons of nitroglycerin. of destruction there is of an entirely different nature.

These figures, are of course, only approximate, as I am not I enclose a letter from the Halliburton Company, who do 90% of this familiar with the local conditions of the operations or of the wells, but class of work throughout the world.

all of this information could be secured in great detail and with Lastly, to make this plan successful it must be prepared with as comparative exactitude from the operating companies, but I do give these much secrecy and in as complete detail as any army campaign.

in some detail in order that it may be clear that to destroy this number I do not submit this hurried letter as an accurate technical report, of wells in a brief period of time without destroying the fields, calls as I do not have available any of the maps, well logs, or other technical for a personnel of approximately 1400 technically trained men and 9,000 tons which would be necessary to have available to make an accurate report tons of freight and 40 days time in the fields.

on this subject, but if this is of interest to any department of the A further study with the Halliburton Company indicates that the government, I will be glad to fly to Baghdad at my own expense and on my own time and give more detail, or collaborate with the engineers of men and equipment could be reduced one-third.

These men, this material and this time would not be available both of the producing companies in making an accurate estimate of material, after invasion started.

It would not be necessary to destroy refineries, storage oil and I will probably not be called to active service because of my pipe lines until invasion begins, and if Japan should learn that the wells have been destroyed, or were properly prepared to be, and that they could

not be brought into production in sufficient quantity to be of material help in less than three years, there would be no invasion.

I believe that the utmost co-operation could be expected from the operating companies as they stand, from a purely selfish standpoint, to lose their entire investment if it falls into the hands of the Japanese.

To accomplish this without opposition would call for the co-operation of Great Britain and of the Netherland East Indies through the Dutch Government in London, and further, the lease of these properties from the Standard of New Jersey - Socony, (American companies) and the Dutch Shell Company.

In fairness to the companies some arrangement should be made to compensate them for their loss for pre-arranged destruction.

Another alternative would be to advance no money to the oil companies, but contract during the lease period to pay them their average net profit during the period; further contracting to put the properties in their present condition when the war is over, in the event we won the war, and let them bear the loss if we lose the war.

An expedition of specialist of this kind, with their equipment, would be available for the Mesopotamian area if needed, but the problem of destruction there is of an entirely different nature.

I enclose a letter from the Halliburton Company, who do 90% of this class of work throughout the world.

Lastly, to make this plan successful it must be prepared with as much secrecy and in an complete detail as any army campaign.

I do not submit this hurried letter as an accurate technical report, as I do not have available any of the maps, well logs, or other technical data which would be necessary to have available to make an accurate report on this subject, but if this is of interest to any department of the government, I will be glad to fly to Washington at my own expense and on my own time and give more detail, or collaborate with the engineers of both of the producing companies in making an accurate estimate of personnel, material and time.

I will probably not be called to active service because of army rules on age and rank. I offer this letter as my contribution.

Sincerely yours,

John H. Leavell,
Lieut. Col - Eng. Res.

JHL:T

NETHERLANDS EAST INDIES

NAME OF FIELD & LOCATION	Pro- ducing Wells	Daily Prod. (bbl)	Av. Wells Drlg.	Producing Depths	Gravity A.P.I.	Base of Crude	Outlet#	Age of Field (Years)
British Borneo:								
Sarawak and Brunei	470	17,400	2	130-5,790	32	M.	Refinery	31
East Borneo:								
Balikpapan and Tarakan	880	33,700	6	210-3,280	18	A.	Refinery	45
Caram	55	2,000		240-1,020		M.	Refinery	44
Java	330	16,800	3	130-3,000		M.	Refinery	53
South Sumatra:								
Palembang- Djambi	1,350	90,300	25	130-2,950	37.8	P.	Refinery	44
North Sumatra	170	21,800	5	-----		M.	Refinery	55
Total East Indies	3,255	182,000	41					

* A network of pipe lines moves East Indies crude to refining centers on the islands and most of the products are exported to the Far East, Near East, African and European countries. Subsidiaries of the Standard Oil Co., of New Jersey and Royal Dutch-Shell are the principal operating companies.

NETHERLANDS EAST INDIES

	Plant Locat.	Supt.	Crude Cpcty	Type of Ref. inery	Cracking Equip.- Capacity (bbl.Dly)	Type	Oper- ating Status
Borneo:							
de Bataafsche Petroleum Maatschappij (Shell), Carl Van Bijlan- dtlaan 30, The Hague-Balikpapan			35,000	Comp	7,400	Dubbs	Op.
Java:							
N. V. de Tataafache Petroleum Maatschappij (Shell) Carl von Bijlandtlaan, 30, the Hague Wonokromo			2,500	S	None	None	Op.
ditto Tjepoe			14,000	S-c	600	Dubbs	Op.
Nederlandsche Kolonials Pet. Mij. (Standard Vacuum), Gebouw Petrolea, PO Box 109, The Hague Kapeon			500	S	None	None	Op.
Sumatra:							
de Bataafache Pet. Mij. (Shell) Carl Van Bijlandtlaan 30, The Hague Pangkalan Brandon			18,000	S	None	None	Op.
- ditto Pladjoe, Palembang			45,000	S*CL	2,500	Dubbs	Op.
Nederlandsche Kolaniale Pet. Mij., Gebouw Petrolea, PO Box 109, The Hague Palembang			45,000	Comp.	16,000	Tube & Tank	Op.
Sarawak (British East Indies):							
Sarawak Oilfields, Ltd (Shell)							
Miri, Sarawak, Miri Lutong			20,000	S-L	None	None	Op.
TOTAL SUMATRA			108,000		20,900		
TOTAL NETHERLANDS EAST INDIES			160,000		28,500		
TOTAL SARAWAK (British East Indies)			20,000		- - -		
GRAND TOTAL (East Indies)			188,000		49,000		